

# OPERATING SUMMARY

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K57  
W38  
1974  
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## CITY OF **KITCHENER** WATER POLLUTION CONTROL PLANT

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KITCHENER  
WATER POLLUTION CONTROL PLANT

operated for

THE CITY OF KITCHENER

by the

MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

prepared by

Plant Performance Unit

TECHNICAL SERVICES BRANCH

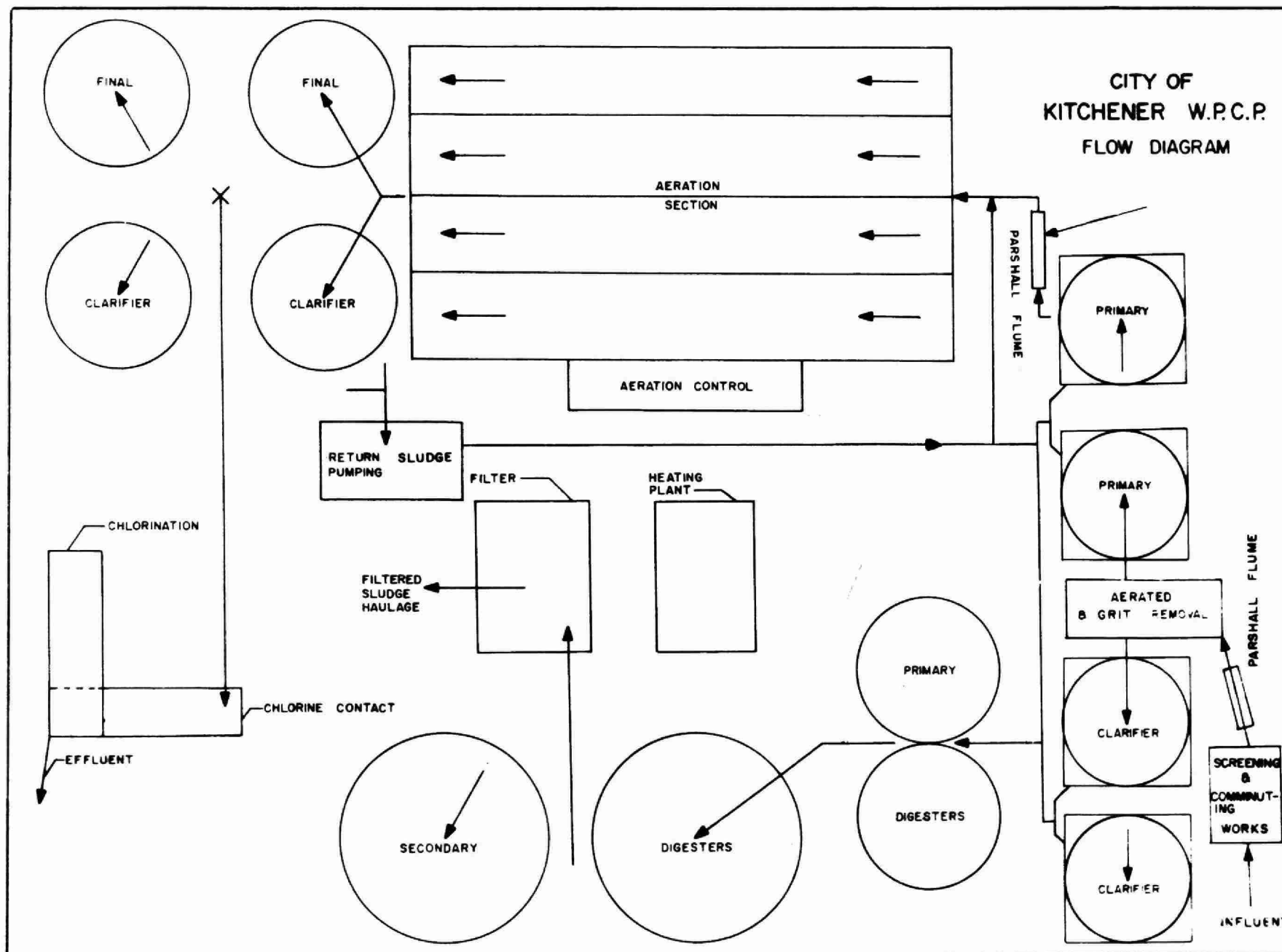
T. Cross, Director

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## CONTENTS

Title Page . . . . .	1
Flow Diagram . . . . .	4
Design Data . . . . .	5
Operating Cost . . . . .	6
Process Data . . . . .	8



# DESIGN DATA

PROJECT City of Kitchener WPCP

PROJECT NO. 2-0019-58

TREATMENT Activated Sludge

DESIGN FLOW 11.0 mgd (Prim)  
13.5 mgd (Sec)

DESIGN POPULATION 100,000

BOD - Raw Sewage 300 mg/l  
- Removal 95%

SS - Raw Sewage 450 mg/l  
- Removal 95%

## PRIMARY TREATMENT

### Screening

- Manually cleaned bar screen with 4" spacing

### Comminution

- One Worthington comminutor

### Grit Removal

Type: Aerated; grit removed by air lift  
Size: Two 11' x 10' x 10.5' deep  
(13,700 gal)  
Retention: 1.7 min

### Air Supply

- Two Sutorbilt blowers

## Primary Sedimentation

Type: Dorr  
Size: Four 60' x 60' x 11' 8" swd  
(1.01 mil gal)  
Retention: 2.2 hours  
Loading: Surface, 765 gal/ft<sup>2</sup>/day  
Weir, 26,200 gal/ft/day

## SECONDARY TREATMENT

### Aeration Tanks

Type: Mechanical aeration,  
serpentine flow (14 cells/tank)  
Size: Four 210' x 60' x 13' 3"  
(680,000 cu ft or 4.2 mil gal)  
Retention: 7.5 hours

### Aerators

Type: Ames Crosta (56)

### Secondary Sedimentation

Type: Dorr  
Size: Four 80' dia x 10' swd  
(1.35 mil gal)  
Retention: 2.4 hours  
Loading: Surface, 672 gal/ft<sup>2</sup>/day  
Weir, 13,400 gal/ft/day

## CHLORINATION

Type: BIF with evaporator  
Size: One 2000 lb/day  
One 600 lb/day

### Chlorine Contact Chamber

Size: (141,000 gal)  
Retention: 15 min

## OUTFALL

- to Grand River

## SLUDGE HANDLING

### Digestion System - Two-stage

Primary --

Type: Dorr, single mixer  
Size: Two 65' dia x 22' swd  
(144,000 cu ft or 0.90 mil gal)  
Loading: 1.08 lb/cu ft/day

Secondary --

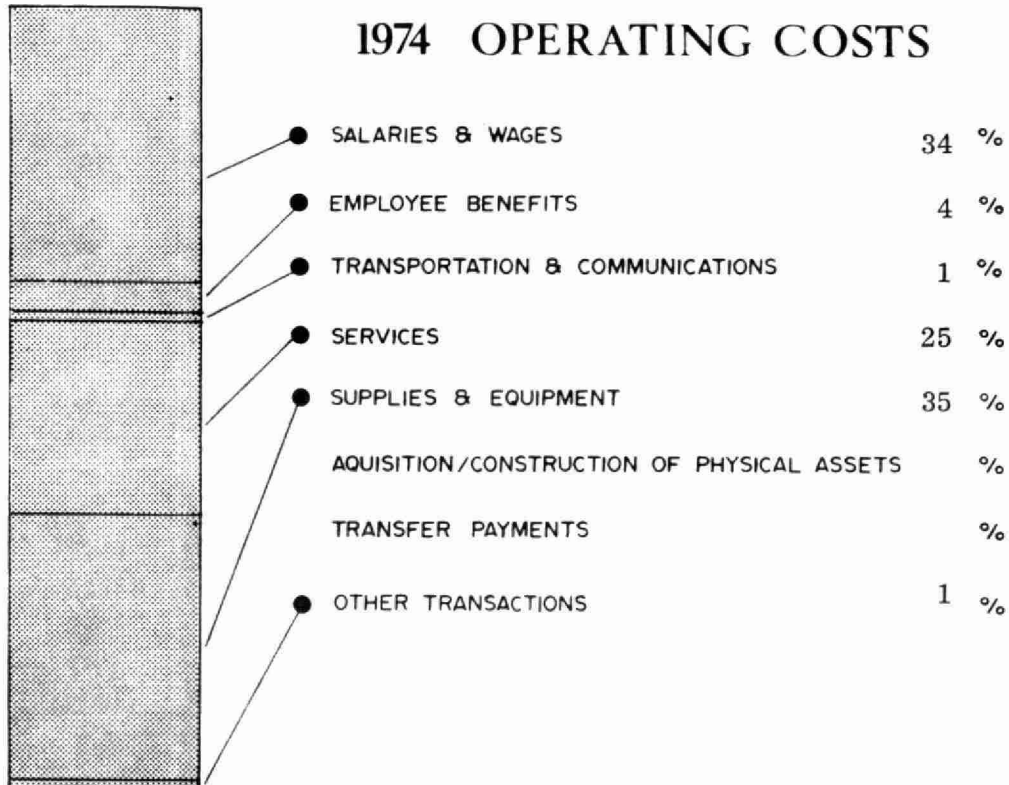
Type: Dorr, floating cover  
Size: Two 100' dia x 29' swd  
(400,000 cu ft or 2.5 mil gal)  
Total Loading: 0.29 lb/cu ft/mo

### Vacuum Filter

Type: Komline - Sanderson  
Size: One 500 sq ft

# ANNUAL COSTS

## 1974 OPERATING COSTS



## YEARLY OPERATING COSTS

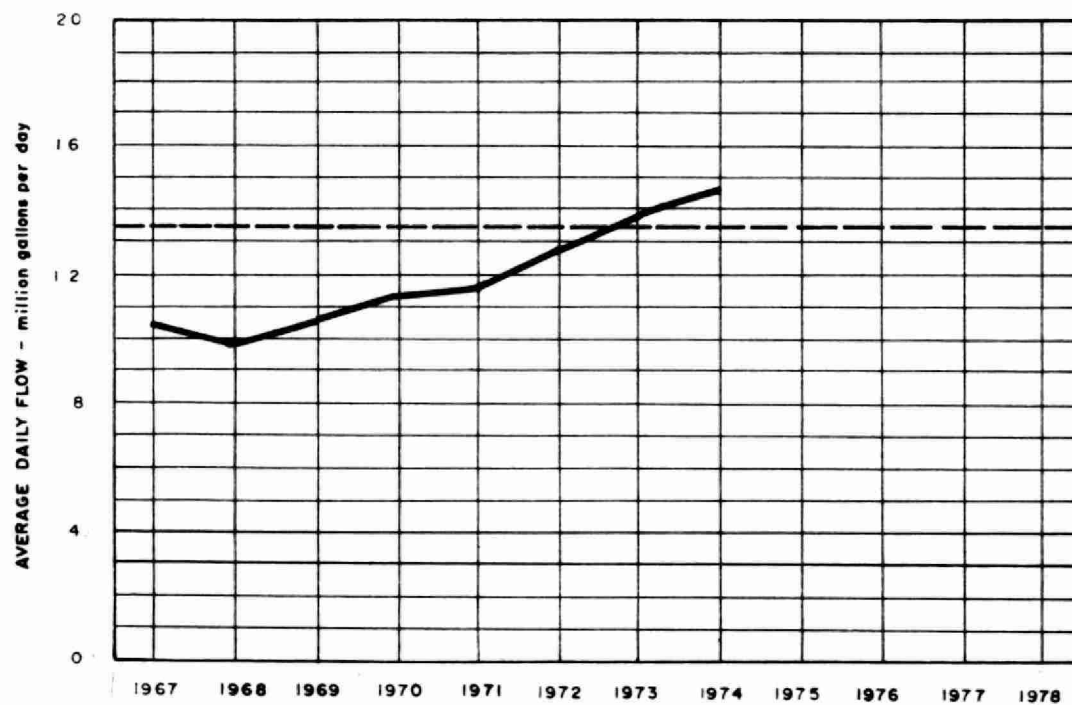
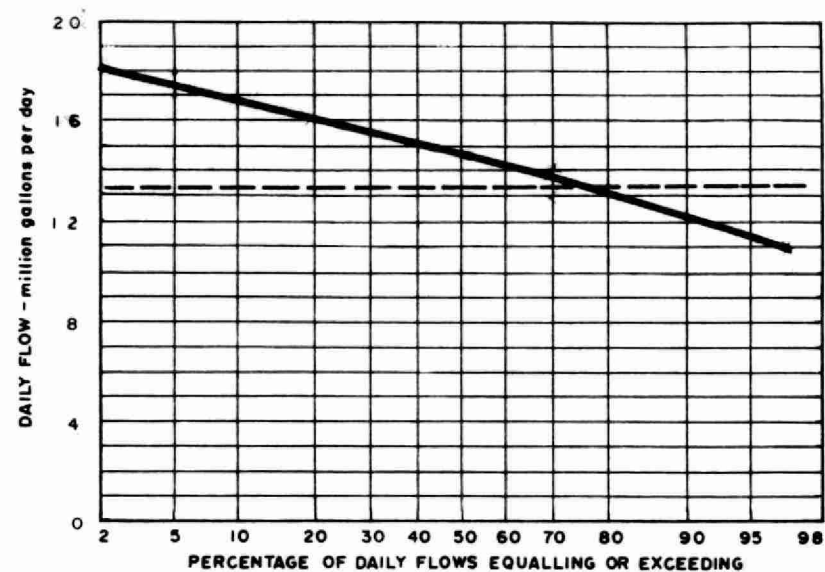
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G.	¢/lb BOD
1969	3888	275,558	71	3
1970	4130*	275,978	67	3
1971	4284	299,110	70	3
1972	4616	343,247	74	4
1973	5020	411,770	82	4
1974	5256	579,793	110	6



# OPERATING EXPENDITURES

Regular Staff	\$ 193,296	\$
Casual (Unclassified) Staff	6,055	
TOTAL SALARIES AND WAGES		199,351
TOTAL EMPLOYEE BENEFITS		20,299
TOTAL TRANSPORTATION AND COMMUNICATIONS		3,396
Insurance	7,383	
Sludge Haulage	116,830	
Repairs and Maintenance	18,084	
Other Services	3,189	
TOTAL SERVICES		145,486
Machinery and Equipment	7,317	
Chemicals	131,785	
Utilities	51,511	
Other Supplies and Equipment	12,956	
TOTAL SUPPLIES AND EQUIPMENT		203,569
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		-
TOTAL TRANSFER PAYMENTS		-
OTHER TRANSACTIONS		7,692
GRAND TOTAL	GRAND TOTAL	\$ 579,793

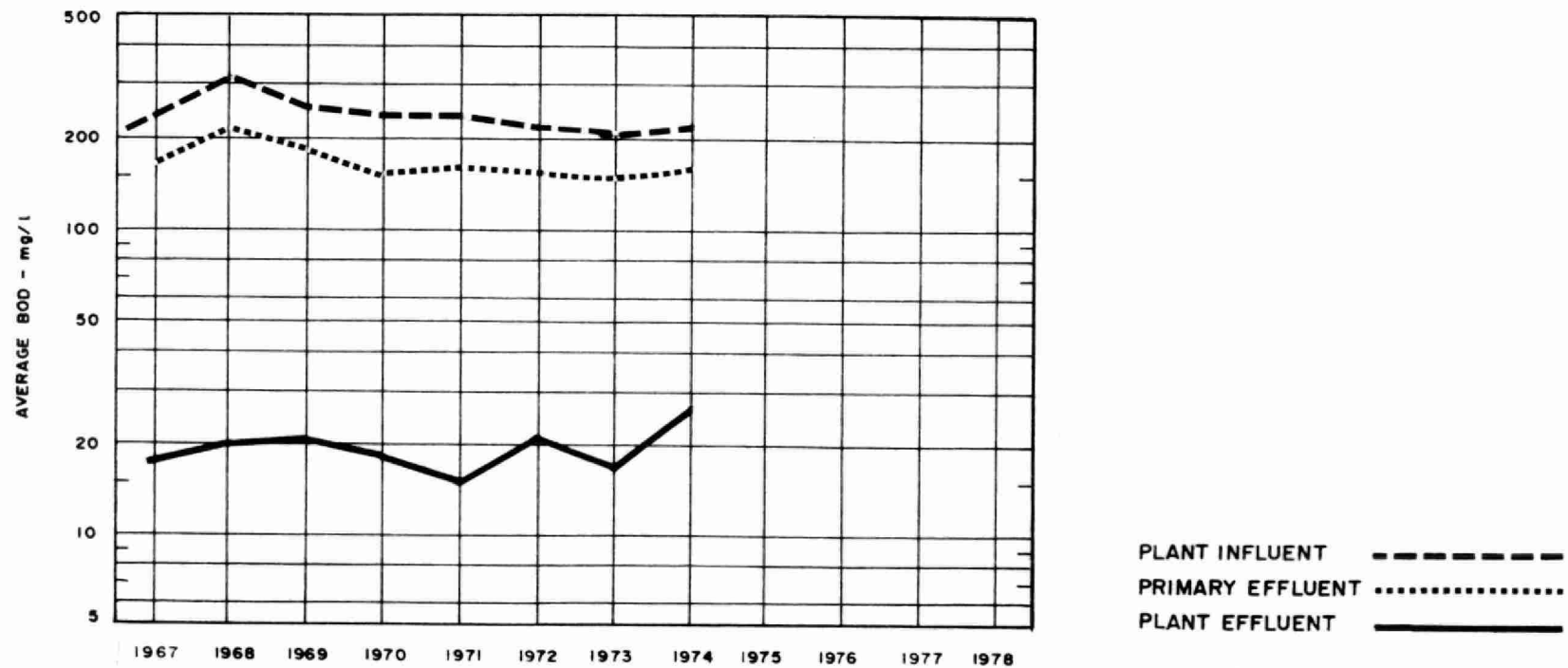
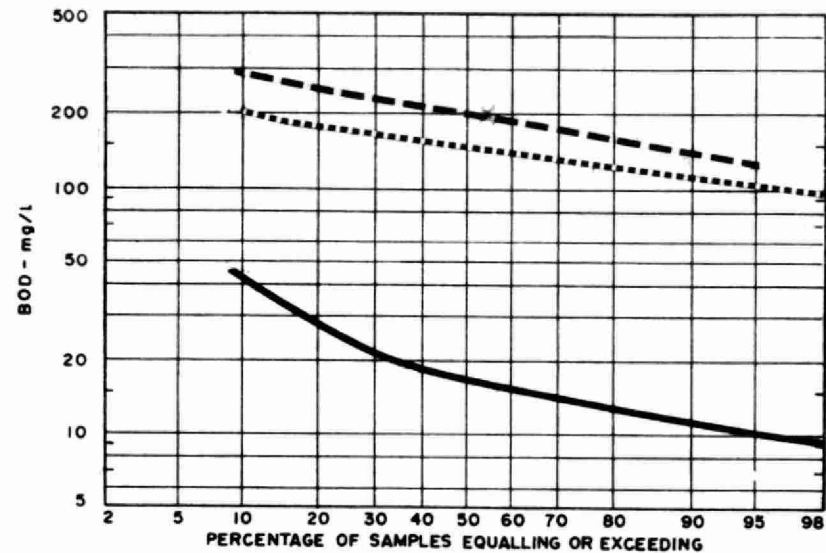
# FLows



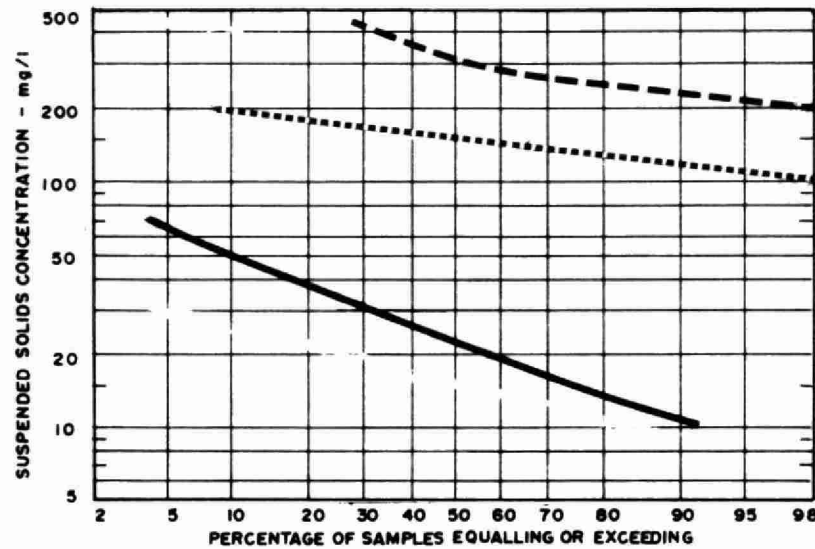
## PLANT PERFORMANCE




MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 <sup>3</sup> pounds			%	10 <sup>3</sup> pounds		
JAN	-	-	-	175	28	84	-	275	35	87	-	8.9	1.2
FEB	389.2	13.9	15.9	216	18	92	770	315	34	89	1094	9.5	1.3
MAR	484.5	15.6	22.3	177	16	91	780	272	31	89	1168	5.8	1.1
APR	473.9	14.6	22.4	194	23	88	810	299	89	70	995	-	1.3
MAY	477.0	15.4	17.7	207	28	86	854	274	36	87	1135	-	1.0
JUNE	451.6	15.1	17.6	191	8	96	826	316	14	96	1364	7.6	.7
JULY	432.9	14.0	16.9	279	23	92	1108	289	17	94	1177	-	-
AUG	419.2	13.5	15.4	295	20	93	1153	356	10	96	1450	-	-
SEPT	407.4	13.6	15.6	223	50	78	704	355	15	96	1385	7.5	.8
OCT	434.6	14.0	14.9	284	26	91	1121	345	29	92	1373	-	1.6
NOV	432.8	14.4	15.6	231	33	86	857	333	33	84	1216	7.5	1.7
DEC	414.7	13.4	15.5	258	30	88	949	313	20	94	1215	7.6	.9
TOTAL	5256.0 Est.	-	-	-	-	-	-	-	-	-	-	-	-
AVG.	-	14.4	MAXIMUM 22.4	225	27	88	946	312	30	90	1347	7.7	1.2
No. of Samples	-	-	-	89	93	-	-	243	241	-	-	8	194

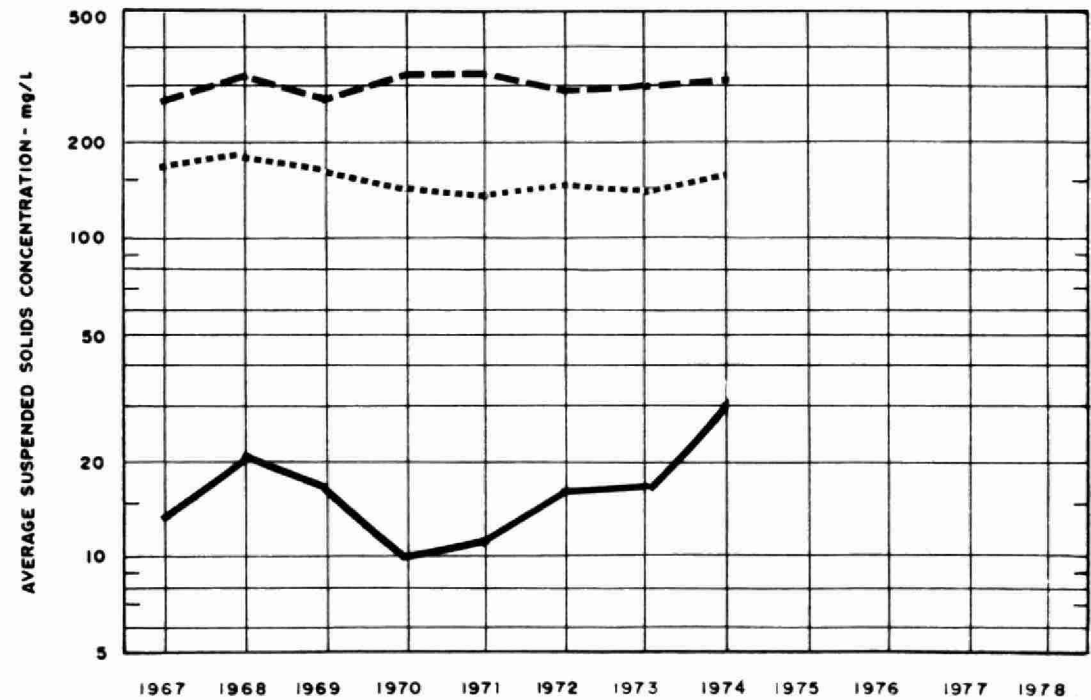
# BIOCHEMICAL OXYGEN DEMAND



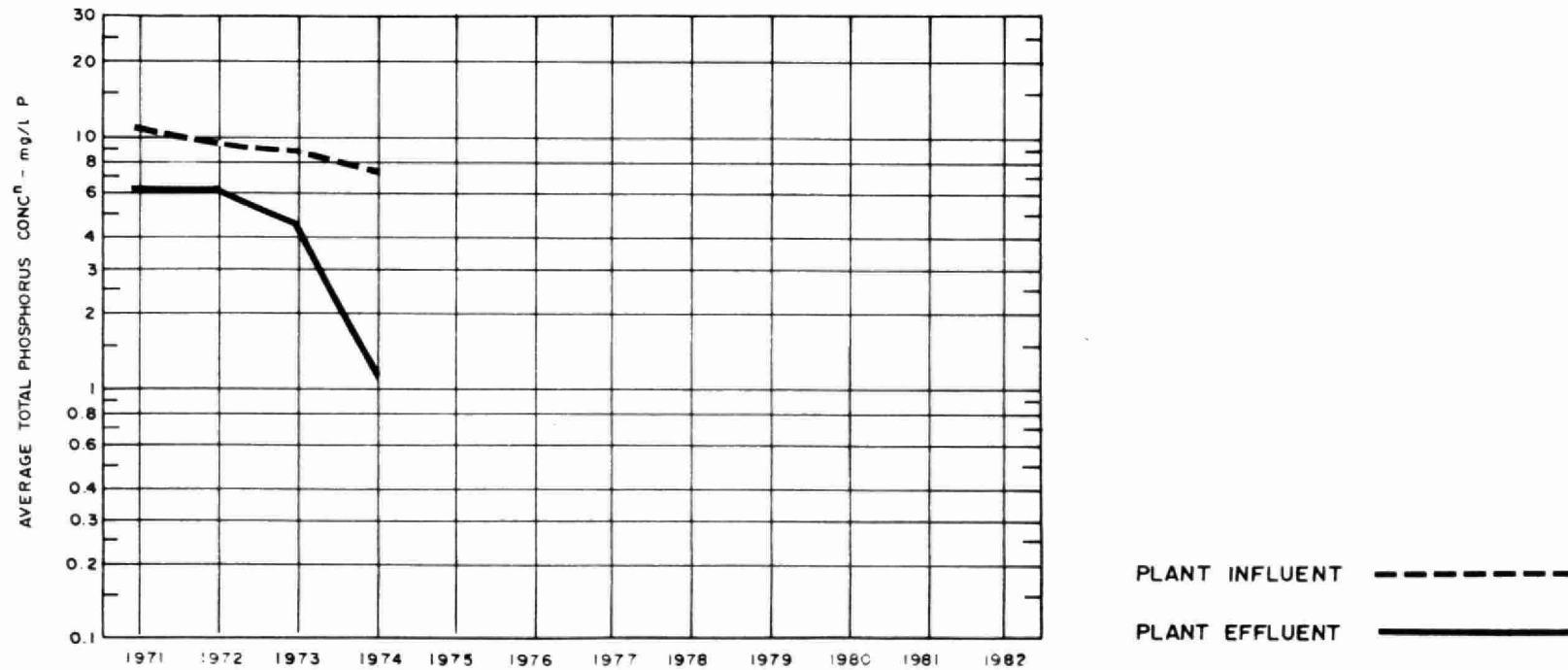
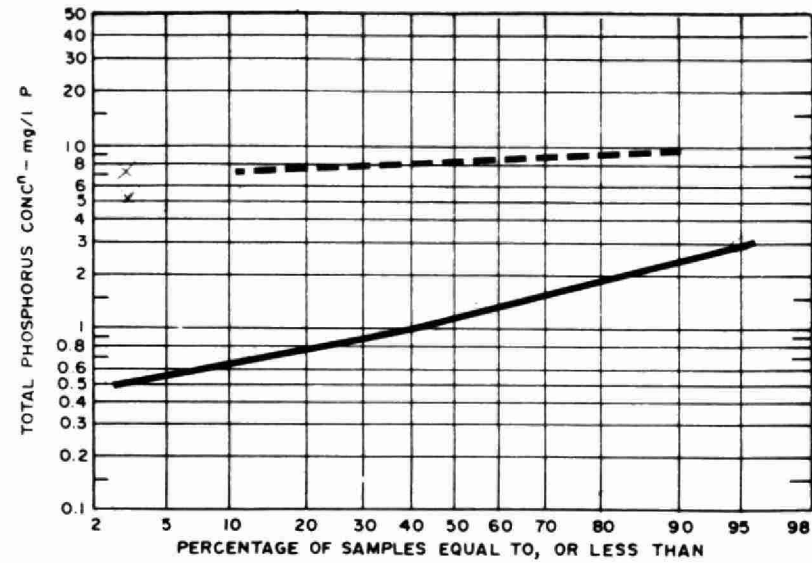
# SUSPENDED SOLIDS



PLANT INFLUENT      
 PRIMARY EFFLUENT      
 PLANT EFFLUENT    

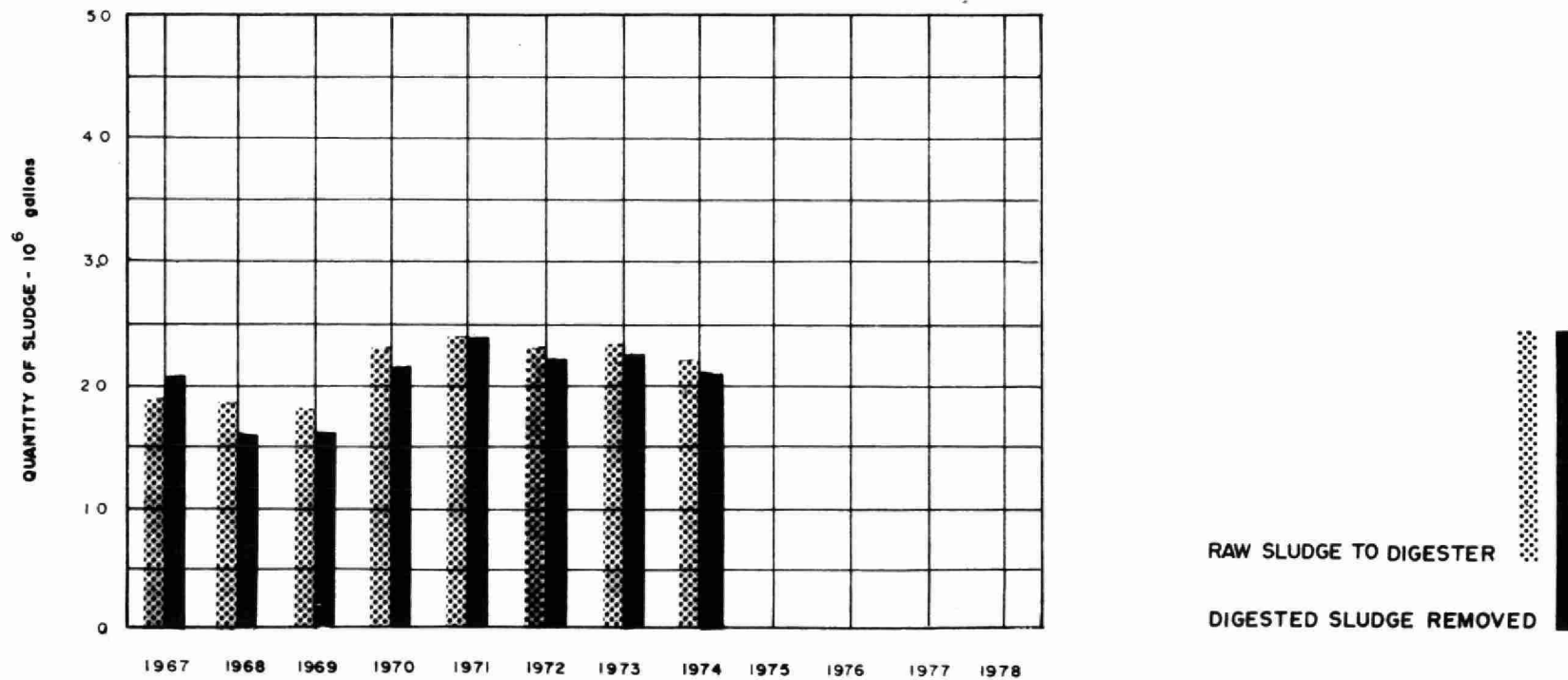
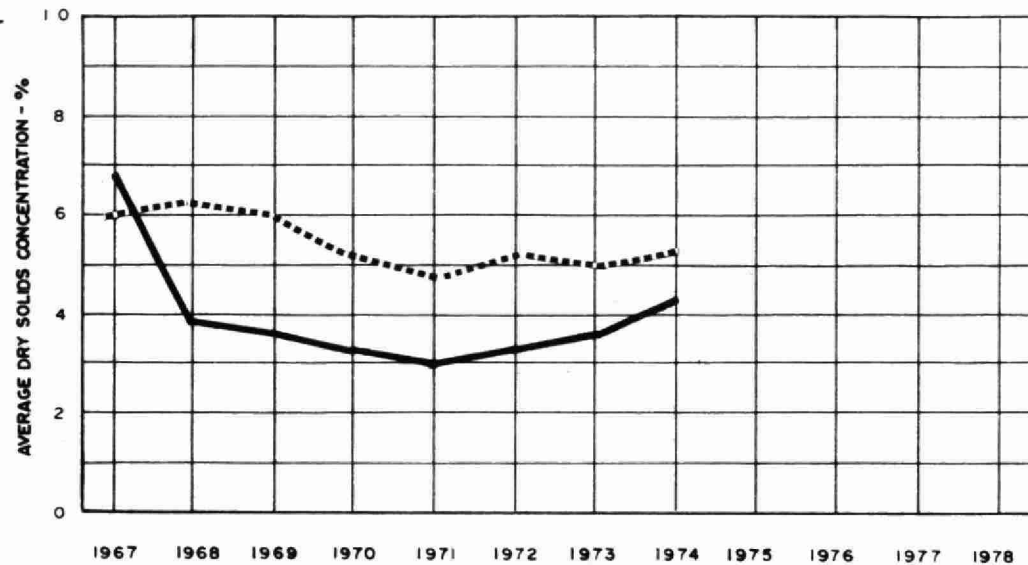


# PHOSPHORUS



# DIGESTION

RAW SLUDGE .....  
DIGESTED SLUDGE —



## TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL <sub>2</sub> USED 10 <sup>3</sup> pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day <sup>-1</sup>	AIR 1000 ft <sup>3</sup> lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 <sup>6</sup> gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 <sup>6</sup> gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	259	15.0	-	153	157	3100	-	-	2.2	4.6	62	1.7	3.6	58	.1	6700
FEB	175	14.7	4.2	148	146	3400	.15	-	1.8	4.7	57	1.7	3.3	52	.1	7604
MAR	210	12.8	2.7	136	145	4100	.13	-	1.9	5.4	59	1.6	4.4	46	.1	4219
APR	259	13.3	2.8	134	146	4100	.12	-	2.1	5.2	59	1.8	5.1	53	.1	5587
MAY	294	15.0	3.1	138	136	3800	.14	-	2.1	5.3	62	1.6	5.6	51	.1	5842
JUNE	280	8.3	2.7	128	148	3800	.12	-	2.1	5.3	53	1.8	5.2	47	.2	8738
JULY	252	12.6	2.9	147	148	4000	.13	-	1.9	5.9	-	2.1	4.0	40	-	12327
AUG	273	13.9	3.3	151	152	3600	.14	-	2.3	5.1	60	2.1	4.1	44	-	1140
SEPT	259	13.7	3.4	153	169	3700	.14	-	2.1	5.0	62	1.9	3.8	44		11581
OCT	238	15.5	3.6	200	188	3500	.20	-	1.8	5.9	65	2.3	3.3	51		11723
NOV	210	14.9	3.4	155	183	4000	.14		1.9	5.9	62	1.3	4.1	53		5264
DEC	196	13.6	3.3	197	168	3800	.02		2.1	5.7	66	1.9	5.0	43		4528
TOTAL	2905	163.3	-	-	-	-	-	-	24.3	-	-	21.8	-	-	-	85253
AVG.	.6 cu. ft./mil gal	13.6	3.1	154	158	3700	.13		2.0	5.3	61	1.8	4.3	49	.1	7104



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